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File: JPAB

Feb 19, 2002

PUB-NO: JP02002053321A

DOCUMENT-IDENTIFIER: JP 2002053321 A

TITLE: LITHIUM MANGANESE MULTIPLE OXIDE, ITS MANUFACTURING METHOD AND USE THEREOF

PUBN-DATE: February 19, 2002

## INVENTOR-INFORMATION:

NAME	COUNTRY
MASHIMA, HIROSHI	
SANUKI, SUMIKO	
KUBOTA, MAMORU	
NAKAHARA, KIYOSHI	
NAKAJIMA, RYOSUKE	

## ASSIGNEE-INFORMATION:

NAME	COUNTRY
TITAN KOGYO KK	

APPL-NO: JP2000238020

APPL-DATE: August 7, 2000

INT-CL (IPC): C01 G 45/00; H01 M 4/02; H01 M 4/58; H01 M 10/40

## ABSTRACT:

PROBLEM TO BE SOLVED: To obtain lithium manganese multiple oxide having a cluster particle form and a dense and uniform composition excellent in packing property as an electrode active material, to provide a method for manifesturing the oxide at a low cost without processes of pulverization or repeated heat treatment, to obtain a positive electrode material by using the lithium manganese multiple oxide, and to provide a high-performance lithium secondary cell by using the positive electrode active material.

SOLUTION: The lithium manganese multiple oxide has a secondary particle form prepared by aggregating almost spheric primary particles essentially comprising  $\text{LiMn}_2\text{O}_4$  into clusters. The median diameter of the secondary particle form ranges from 1 to 100  $\mu\text{m}$  and the specific surface area is 0.1 to 10  $\text{m}^2/\text{g}$ . The obtained particles are used as the positive electrode active material to manufacture a lithium secondary cell.

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L6: Entry 2 of 2

File: DWPI

Feb 19, 2002

DERWENT-ACC-NO: 2002-387576

DERWENT-WEEK: 200242

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TITLE: Lithium manganese complex oxide used as active material for secondary battery, contains aggregated primary particles and secondary particles containing lithium manganese oxide of specific diameter and surface area

PATENT-ASSIGNEE:

ASSIGNEE

TITANIUM KOGYO KK

CODE

TITAN

PRIORITY-DATA: 2000JP-0238020 (August 7, 2000)

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PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
<input type="checkbox"/> <a href="#">JP 2002053321 A</a>	February 19, 2002		008	C01G045/00

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
JP2002053321A	August 7, 2000	2000JP-0238020	

INT-CL (IPC): [C01 G 45/00](#); [H01 M 4/02](#); [H01 M 4/58](#); [H01 M 10/40](#)

ABSTRACTED-PUB-NO: JP2002053321A

BASIC-ABSTRACT:

NOVELTY - Lithium manganese complex oxide contains grape cluster shaped aggregated primary particles and secondary particles mainly containing LiMn2O4 of diameter 1-100  $\mu$ m and specific surface area of 0.1-10 m<sup>2</sup>/g.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following: (i) Manufacture of lithium magnesium complex oxide which involves wet blending epsilon manganese dioxide with a water-soluble lithium compound in a Li/Mn molar ratio of 0.50-0.60. The mixed solution is dried and heat-processed at 500-900 deg. C so that the complex oxide particles are held together. epsilon manganese dioxide mainly contains epsilon MnO<sub>2</sub> crystalline form confirmed by X-ray diffraction. The dioxide comprises grape cluster shaped aggregated particle of specific surface area 100-300 m<sup>2</sup>/g and particle diameter of 50  $\mu$ m or less; (ii) Battery anode comprising the lithium manganese complex oxide as positive electroactive material; and (iii) Lithium secondary battery having initial stage electric discharge capacitance of 120 mAh/g or more and rate of 20 cycle of discharge capacitance exceeding 80%.

USE - Used as active material for lithium secondary battery.

ADVANTAGE - Lithium secondary battery of high performance is obtained. The complex oxide has minute and uniform composition and excellent packaging property. The method of packing the

oxide as electroactive material is economical.

DESCRIPTION OF DRAWING(S) - The figure shows the X-ray diffraction of manganese oxide. (Drawing includes non-English language text).

CHOSEN-DRAWING: Dwg.1/5

TITLE-TERMS: LITHIUM MANGANESE COMPLEX OXIDE ACTIVE MATERIAL SECONDARY BATTERY CONTAIN AGGREGATE PRIMARY PARTICLE SECONDARY PARTICLE CONTAIN LITHIUM MANGANESE OXIDE SPECIFIC DIAMETER SURFACE AREA

DERWENT-CLASS: E31 L03 X16

CPI-CODES: E35-S; L03-E01B5A; L03-E01B5B;

EPI-CODES: X16-E01C1; X16-E01G; X16-E08A;

CHEMICAL-CODES:

Chemical Indexing M3 \*01\*  
Fragmentation Code  
A103 A425 A940 C108 C550 C730 C801 C802 C803 C804  
C805 C807 M411 M720 M904 M905 N104 N513 N514 N515  
Q454  
Specific Compounds  
A3TEYK A3TEYP

Chemical Indexing M3 \*02\*  
Fragmentation Code  
A103 A425 A940 A980 C108 C550 C730 C801 C802 C803  
C804 C805 C807 M411 M720 M904 M905 N104 N513 N514  
N515 Q454  
Markush Compounds  
200063-55301-K 200063-55301-P

Chemical Indexing M3 \*03\*  
Fragmentation Code  
A425 A940 C108 C550 C730 C801 C802 C803 C804 C805  
C807 M411 M730 M904 M905  
Specific Compounds  
01936K 01936S  
Registry Numbers  
1936S 1936U

UNLINKED-DERWENT-REGISTRY-NUMBERS: 1936S ; 1936U

SECONDARY-ACC-NO:

CPI Secondary Accession Numbers: C2002-109462

Non-CPI Secondary Accession Numbers: N2002-303692

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